

**DESCRIPTION**

Under this Item, the CONTRACTOR shall provide all labor, material, and equipment necessary to furnish and install steel casing pipe, wall thickness of 9.5 mm including all earth excavation, sheeting, bedding, backfilling, installation of casing spacers placed around carrier pipe, placement of Control Density Fill, restoration of bore and receiving pits for under other items per Contract Documents.

**MATERIALS**

**CASING PIPE**

Casing pipe shall be bar steel casing pipe API 5L Grade B seamless or electric welded pipe, or approved equal. Furnish finished lengths of pipe with beveled cut ends to facilitate proper welding of transverse joints.

Casing pipe must be new pipe that has smooth surfaces that are uniform and free of bulges, dents or warping throughout entire length.

Minimum casing pipe diameter is 610 mm, with a minimum wall thickness of 9.5 mm. If the jacking/boring operation requires a larger diameter or heavier wall thickness, it shall be furnished and installed by the Contractor under this Item, at no additional cost.

Shop coat all surfaces (exterior and interior) of the pipe (except for a one-inch wide circumferential band at ends of pipe lengths which are to be jointed by field welding) with one coat of Koppers Bitumastic Super Service Black, Tnemec Heavy Duty Black 46-449, Mobil 35-J-10 or approved equal. Remove all scale and rust with a wire brush. Wipe clean and dry all surfaces prior to painting. Clean greasy or oily surfaces with benzine or mineral spirits. Paint field weld areas with one coat of bitumastic.

**CASING PIPE SPACERS**

Casing spacer constructed of 14 gauge carbon steel clamp coated with corrosion resistant enamel paint with PVC liner and a minimum of four (4), 38 mm wide, minimum. UHMW polymer runners or glass reinforced plastic runners spaced equally around the circumference to maintain bell clearance on all sides. Runners to be equal length so that carrier pipe is centered in casing pipe. Grade five steel bolts, nuts and washers to be provided with spacers.

**CONTROL DENSITY FILL (CDF)**

"K-Krete" or approved equal with a compressive strength of 345 to 690 kPa. Fly ash or other pozzolan-containing materials are not acceptable in the mix design. The consistency shall be suitable for pumping or flowing into the annular space between a casing pipe and the carrier pipe.

**QUALIFICATIONS**

Boring Firm: Company specializing in performing the work of this Item with minimum of three completed installations and two years documented experience.

**INSTALLATION**

Identify required lines, levels, contours, and datum. Layout necessary excavations and tunnel or bore locations to determine clearances or conflicts with existing structures. Determine outer boundaries of available work area as defined by either easements or right-of-ways. Protect structures near the bore or tunneling work from damage. Relocate utilities which conflict with bore pit excavations.

Place pipe onto ground within right-of-way or easements or other approved locations by means of machinery using slings or other approved methods. Do not dump pipe from trucks.

Unless approved by Resident Engineer, all bores are to be continuous. Install casing pipe by boring and jacking. Prevent unsupported excavation ahead of casing pipe. Install mechanical devices in front of casing pipe that will positively prevent auger and cutting head from leading casing pipe. Do not allow excavation by cutting head to exceed outside diameter of casing pipe by more than 13 mm. When voids occur or bored hole diameter is greater than outside diameter of casing pipe by more than 25 mm, completely fill voids with Control Density Fill.

Bore with an auger and cutting head arrangement that are capable of being removed from within casing in event that an obstruction is encountered.

Select a cutting head suitable for soil being bored, and capable of preventing free flow of soft or poor material.

Weld entire circumference of each joint of casing pipe as each section is installed.

Install restrained joint ductile iron water main by joining and sliding ahead each pipe length by length into casing. Furnish all necessary casing spacers, shims, concrete leveling courses, guide tracks, tools, and other equipment which are required to place pipe into casing true to grade and line. Adequately support water main with casing spacers installed within casing to prevent any possible deflection or damage during and after installation. Water main shall be inspected for alignment and grade. Restrained joint water main shall extend a minimum of 1.5 m beyond each end of casing pipe, before the installation of any fittings.

When water main has been successfully installed in casing pipe and successfully pressure tested, fill space between outside of water main and casing pipe with Control Density Fill. Pump Fill into casing space from one end of casing. Pump until Select Fill is evident at other end of casing, and all visible voids are filled.

**ITEM 660.05XX M      BORING WITH XXX mm CASING PIPE**

Use of water or other liquids to facilitate casing installation and spoil removal is prohibited.

**METHOD OF PAYMENT**

Unit price per linear meter.

**MEASUREMENT AND PAYMENT**

The quantity for which payment will be made shall be the total linear meters of xxx mm diameter steel casing pipe as measured by the Engineer along the centerline of the pipe.

Payment will be made under:

<b><u>Item No.</u></b>	<b><u>Item</u></b>	<b><u>Pay Unit</u></b>
660.0501 M	Boring with 610 mm Casing Pipe (for 152 mm, 203 mm, and 305 mm DI Restrained Joint Pipe)	LM
660.0502 M	Boring with 762 mm Casing Pipe (for 406 mm DI Restrained Joint Pipe)	LM
660.0503 M	Boring with 914 mm Casing Pipe (for 508 mm DI Restrained Joint Pipe)	LM